UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Electrification Administration
Telephone Engineering Division

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Telephone Engineering Newsletter

Newsletters are intended to provide a means of answering questions that arise in the field and to advise the field of new developments. They are not intended to be instructions nor to replace in any respect the presently-approved channels for establishing requirements and procedures. Suggestions for subjects will be appreciated.

Use of Vibration Dampers in Preventive Maintenance Work

TED No. 21, issued May 4, 1955, discussed the use of vibration dampers on conductors placed at increased tensions.

Conductors strung at higher tensions and equipped with vibration dampers experience less abrasion and fatigue than those strung at normal tensions without vibration dampers. Because of reduced vibration pole line hardware loosening is also reduced. The damper reduces vibration approximately 99 percent and the end result will be longer conductor life, fewer service interruptions and lower maintenance costs. Also, dampers will minimize annoying hum on structures caused by drop wires transmitting line wire vibration from poles to buildings.

In any area where conductor abrasion is being experienced or is suspected, consideration should be given to placing dampers on a "maintenance" basis; i.e., whenever a pole supporting aerial wire is climbed that one damper be placed on each wire in each span adjacent to the pole. Only one damper per wire per span is required. This activity also could be included as part of a scheduled preventive maintenance program.

An effective type of damper presently available is designated the "B" vibration damper. It is a polyethylene tube 18 inches long with $\frac{1}{4}$ inch inside diameter, 1/16 inch wall thickness and spirally split for placing on the line wire. It can be obtained for about 8 cents and if placed on a "maintenance" basis should require no additional labor cost.

REA field engineers are urged to suggest the use of vibration dampers on a maintenance basis to borrowers who are experiencing conductor abrasion or who may have reason to expect conductor abrasion or fatigue from vibration.

Glass Insulators

The new TS-23 double groove glass insulator which replaced the CSC-22 insulator has recently been purchased in considerable quantities for REA projects. This insulator is nearly 4 cents higher in cost than the "Toll Grade" insulators (No's 2 and 17). Special steel pins and plastic bushings are required with the TS-23 because its internal threads do not fit

wood pins, wood cobs on standard steel pins, nor on wood brackets.

The characteristics of the "Toll Grade" insulators are so nearly the same as the TS-23 that they are the most suitable insulators for use on all circuits of REA borrowers' telephone systems for local exchange lines and toll or trunk lines whether these are voice or carrier frequency type. The leakage characteristic of the "Toll Grade" insulator is better than the "double petticoat". Addendum to TE & CM Section 625 spells out that the No. 17 is adequate for all purposes and that the double petticoat insulators should no longer be called for in plans and specifications. The double groove transposition insulators will continue to be standard for tandem transpositions.

The forthcoming revision of the "Telephone System Construction Contract", Form 511, will reflect this decision.

TE & CM Sections, New, Revised and Addenda

The following is a list of TE & CM material in the process of reproduction for issue.

Rev. Section 156 - Nationwide Operator Toll Dialing
Rev. Section 206 - Preparation of an Area Coverage Survey
Add. Section 218 - Plant Annual Cost Data For System Design Purposes
Rev. Section 301 - Central Office Buildings
Rev. Section 430 - Subscriber Line Loading
Add. Section 455 - Inductive Coordination
Rev. Section 505 - Telephone Traffic - Terminology and Calculations
Rev. Section 510 - Telephone Traffic - Dial CO Equipment Switch Quantities
Add. Section 625 - Open Wire Pole Top Assembly Units
Add. Section 701 - Station Installation
New Section 821 - Multipair Distribution Wire Protection

Revision of Telephone System Construction Contract, Form 511

Revision of Form 511 is about completed and will be sent to the public printer for reproduction March 1, 1956. The printing will require about six weeks. Sometime after May 15th the use of present 511 forms will be discontinued. Engineers should be advised of this so that they do not get too large a stock of present issue.

Splints on Double Brackets, Double Arms and Tandem Brackets

The double V-notch type splints and the splints for the new prelashed tie will intertwine their ends where used on tandem transposition brackets. In such usage their ends need not be cut off between insulators. Where they are used on double brackets as in PA1-3, PA1-3A and PA2-3A units; on double arms as in PB1-2, PB3-2, PB3-4, PB5-2 and PB5-4 units the ends

between insulators will not intertwine and these ends must be cut off. The cuts should be such that the ends are about equal in length with about ½ inch or less between ends. The use of straight splints and the Reinforced Tie (Guide Drawing 163) is optional on these named units. The splints will intertwine without difficulty in this usage. These conditions will be covered in the forthcoming revision of Form 511.

Insulator Breakage at Point Type Transpositions

In November it was ascertained that one Hemingray No. 17 insulator was broken on each of a considerable number of "Santa Fe" type point transposition brackets on a Montana project. Investigation of this unusual phenomenon has been made with the assistance of the testing laboratory of Owens-Illinois, Toledo, Ohio; the company which owns the Kimble Glass Company, maker of these Hemingray insulators. The inspection of broken insulators disclosed that every broken insulator that was inspected showed scratches on the threaded or inner portion of the insulator where the breaks started. These scratches were determined to be due to sand that got in between the wood cob of the pins and the insulator glass. Some amount of rotation of the glass on the cob was required to cause a scratch. It was further determined that the inner surface of the glass at the scratch must be in tension to cause the glass to break. This was found to be possible due to the fact that the taper of the cob is different from the taper of the threaded portion of the insulator. When a glass is turned down on a cob its rotation is stopped by the top of the cob. This makes the threads of the glass bind on the cob near the bottom portion of the insulator threads with no contact between cob and glass at the upper portions of the cob and glass threads. The pressure of the line wire on the exterior of the glass puts the unsupported inner surface of the glass in tension adjacent to the wire. This can cause slow breaks to start on the scratched unsupported inner surface which may take some time, (from seconds to months), to cause complete fracture of the glass.

If other projects are experiencing glass breakage on point brackets, the cases should be reported to REA. It is not believed this trouble is general since construction practices used elsewhere do not cause rotation of the insulators on the pins as is possible with the special roller type tool used on the particular project (Mid-Rivers Telephone Company) to throw in the transpositions.

Staking School

A joint meeting or school was held by REA staff engineers February 14, 15, and 16, 1956, in New York City attended by REA Northeast Section field engineers and consulting engineers, on pole line staking for cables, open wires, and rural distribution wire. REA staff engineers prepared material for the meeting and led the discussions which proved to be very helpful to all concerned. The material used will be available for use in similar schools elsewhere.

Parallel Paired Wire for Long Spans - Trials Desired

Trial installations are desired using the recently developed wire having two conductors under one cover as described in Newsletter No. 10, December 1955. A memorandum giving design and construction information is being prepared and will be available soon.

Revised Central Office Equipment Contract

The revised "Central Office Equipment Contract", Form 525, has been sent to the printer and copies will be distributed about March 15, 1956.

Misapplication of Anchors (Types)

Difficulty has been experienced with 8-way expanding anchors when placed in sand. In some types of sandy soil the force required on the expanding bar to set the anchor dislodges the sand, which flows into the interstices between the anchor plate and the blades preventing full expansion of the blades, thus reducing holding power.

When this condition was determined swamp type anchors were substituted at a much higher unit cost. The additional cost in one instance amounted to $2,150.00 for 82 anchors.

It is thought that in such cases, consideration should be given to substituting suitably sized 4-way expanding anchors or plate anchors instead of the swamp anchors. The 4-way anchors expand by hinge action which requires less expanding tool force and the plate type anchors require no expanding. A considerable saving could have resulted from choosing the correct type of anchor for this type of soil.

Tandem Type Insulator Service Difficulties

The insulation between two wires on tandem type insulator is much less than between two wires on separate insulators. This can cause false operation of line relays or ringing failures during light rains or heavy fogs. Galvanic corrosion may also occur between the two wires on these insulators. To date no reports of such trouble has been heard. It is advisable for maintenance forces to be familiar with the possibilities. Any such trouble experienced should be reported to REA.